

Discussion Topic 3: “Customer Response to Extreme Weather”

Lessons from Customer Response in 2000-2001 Crisis

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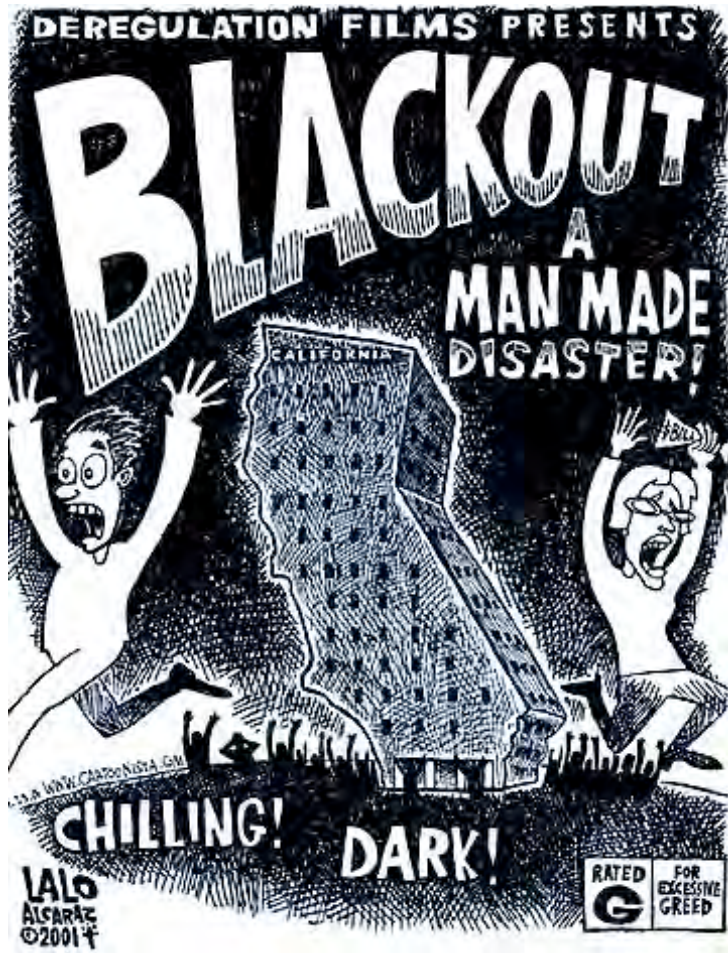
Questions

- ✓ What did people do during the crisis?
- ✓ Why did they do it?
- ✓ What might they do in the future?

Data Sources

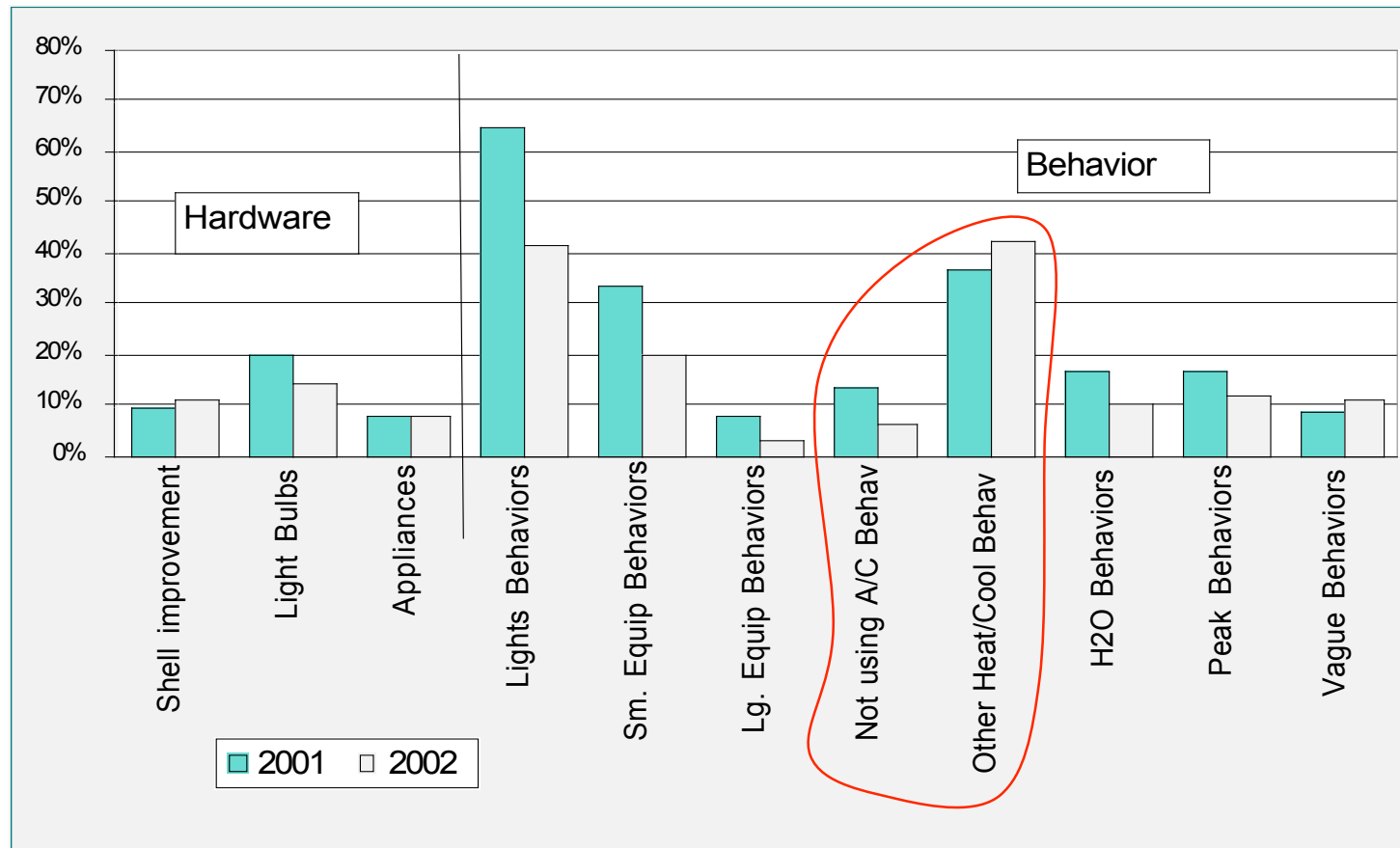
- CEC surveys
- RASS & SPP
- Behavioral Literature

Surprising Results of the Crisis



- 1) Unexpected consumer flexibility and conservation response.
- 2) Changes in behavior rather than efficiency improvements accounted for most of the energy savings.
- 3) Persistence of some behavioral changes after the immediate crisis had passed.

Conservation Actions Reported - 2001 & 2002



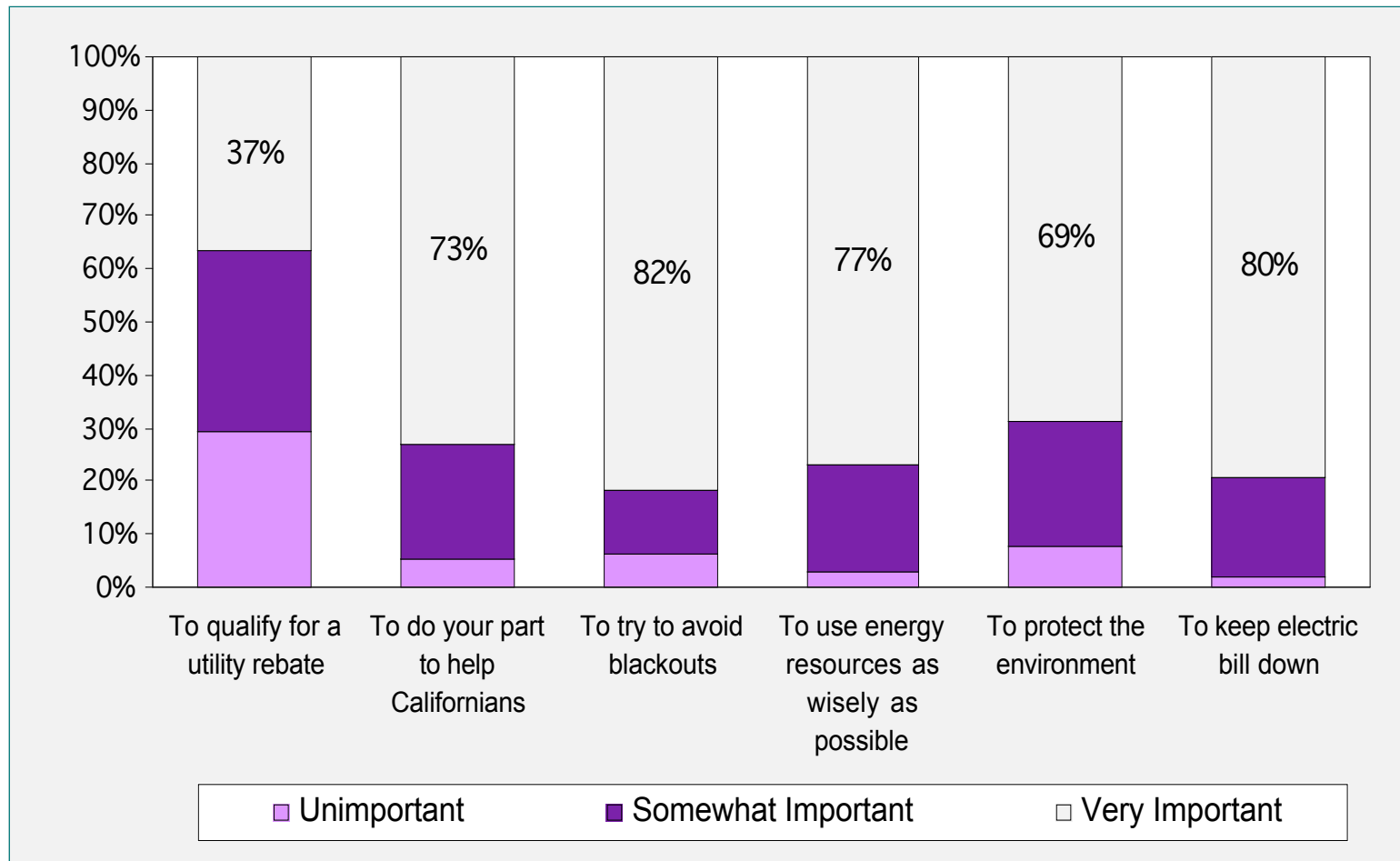
Reducing Peak Demand

- Peak shifting (e.g. clothes washing, dish washing, cooking, cleaning) was reported, but relatively rare
- Cooling changes were more frequent (and likely more important)
 - raising thermostat settings (suggested behavior) was quite rare
 - non-use of AC and sparing use (manual) of AC was much more common

36% of Central AC owners used little or no AC

29% of Room AC owners used little or no AC

Why Conservation? Civic/Social concerns as well as cost issues



Will People Conserve in the Future?

It depends . . .

Concern - *awareness & motivation*

Capacity - *knowledge & resources*

Conditions - *circumstances & constraints*

$$\text{Conservation Action} = C_1 + C_2 + C_3$$

Conservation is an Acceptable Request

“It makes sense to ask citizens every once in a while to reduce their energy use ... to avoid blackouts and keep costs down”

agree = 93%

“It’s worth it to *pay more* ... in order to *never* be asked to conserve”

disagree = 88%

“Real lifestyle changes are needed to solve our energy problems”

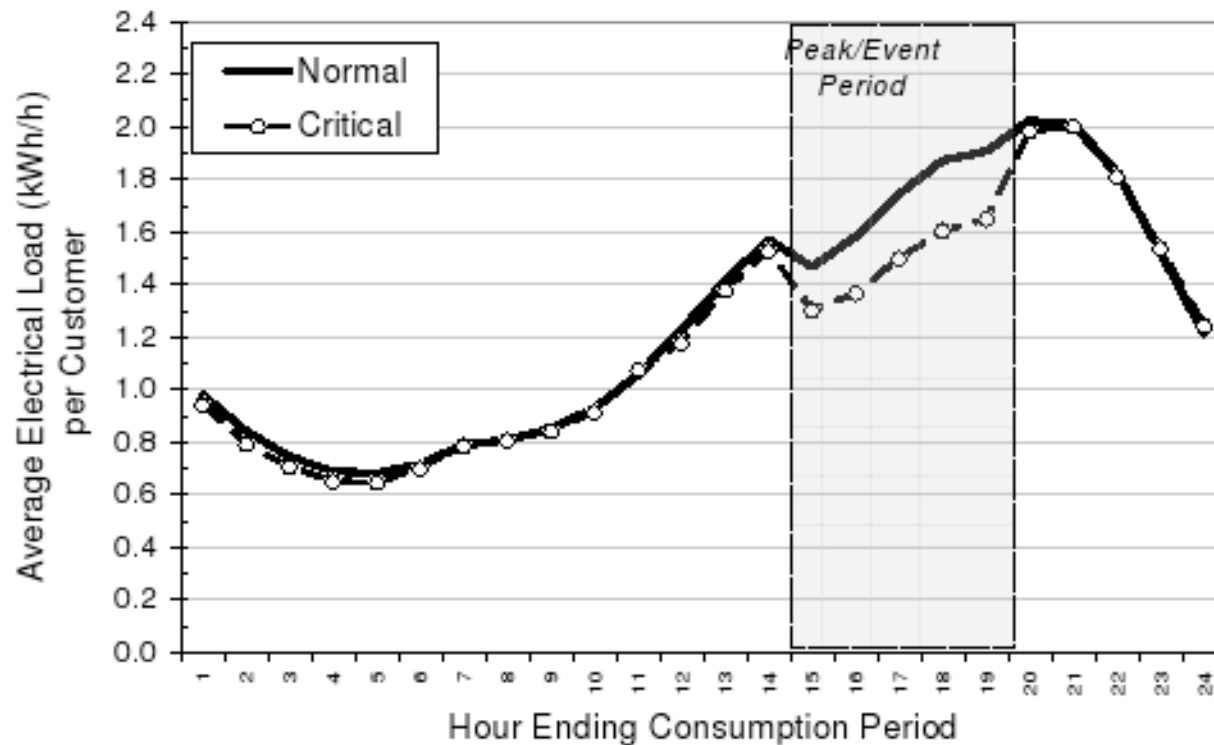
agree = 66%

“My conservation actions...”

“had no serious effect (on my lifestyle)” 55%

“possibly improved my quality of life” 22%

Evidence of Routine Critical Peak “Event/Price” Effect



Source: SPP - Figure 5 in Herter, McAuliffe & Rosenfeld (LBNL-58956)

Behavioral Econ/Soc Questions

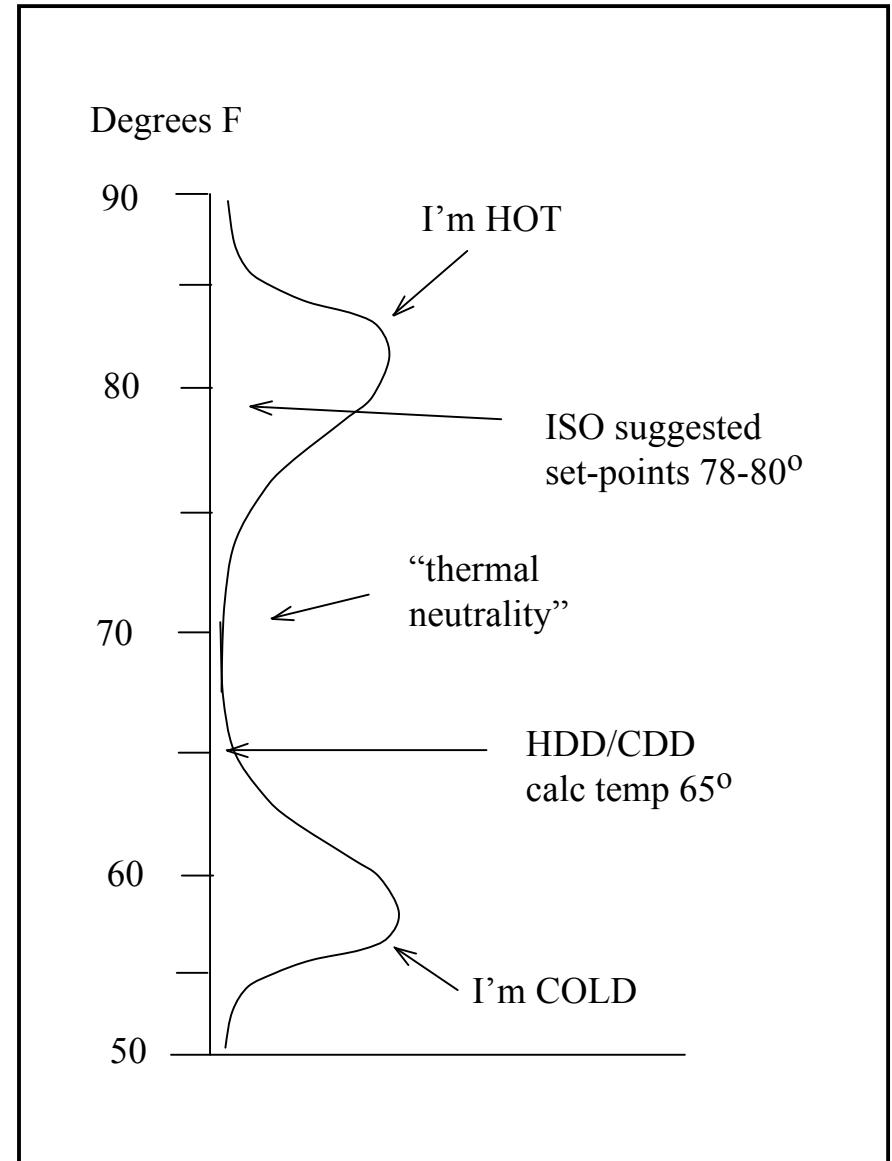
(Work in Progress)

- What are the best times for TOU peak?
(e.g., 5:00-7:00 vs. 2:00-7:00)
- Optimal time and length of critical peak event?
- What prices are considered fair/unfair?
(issues in allocation of risk)
- What price levels/shifts are motivating?
- Effectiveness of manual vs. programmed T-stat control?
- Will emphasis on price (as a policy mechanism) work to *crowd out* social/civic/altruistic response?

How much conservation during very hot weather might be possible?

“Comfort” Issues

- 1) Comfort is complex and variable across individuals.
- 2) Comfort standards are somewhat elastic (Hungerford)
- 3) What happens at 100°? (SPP)
- 4) What happens with 5+ days of 100°+ temps?

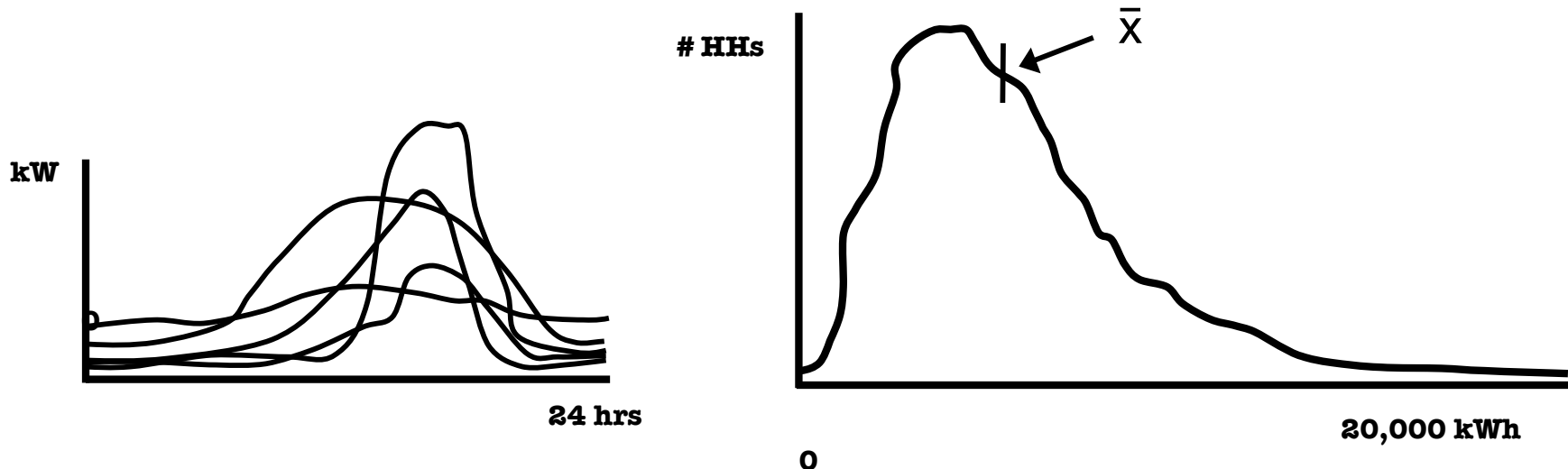


Customers Constrained

- Limited ability to respond - even in emergencies
(73% knew of alerts; only 40% acted)
- Knowledge & information limitations (not stupid, but have different perspectives & arrangements)
 - 92% had heard of “peak energy use problem”
 - 40% incorrectly identify peak period (or didn’t know)
 - at least 1/3 never see their power bills

Highly variable usage patterns that we don't understand very well . . . (yet)

- Dynamic → fluctuating & changing through time
- Diverse → varies across the population
- Limited data with measurement problems
- Averages misleading
- End-use estimates (e.g., UECs) mask variability



Limited/Growing Targets: HHS with AC by Climate Zone

